

CLAIMS:

1. A ventilator (1) for supplying breathable gas to the airway of a patient with a respiratory disorder, comprising:

5 - a gas flow generator (6), such as an electric fan, for generating a flow of said breathable gas to the patient, said gas flow generator (6) comprising a gas flow generator chamber (14) provided with a gas inlet opening (16) and a gas outlet opening (18);

10 - a control valve (24) for controlling the flow and/or pressure of the gas distributed to the patient, said control valve (24) comprising a valve body (26) which is rotatably arranged about a rotational axis (70) within a valve chamber (28), **characterized in**

15 - **that** the rotational axis (70) of the valve body (26) is substantially perpendicular to the exhaust direction of the breathable gas at the gas outlet opening (18) of the gas flow generator (6);

20 - **that** the valve body (26) essentially exhibits the shape of a sector of a circle in a plane perpendicular to said rotational axis (70), in such a way that an arced first flow regulatory surface (74) is formed along the circular arc of said sector, and that second (76) and third (78) essentially straight flow regulatory surfaces, respectively, are formed along the two diverging sides of said sector;

25 - **that** said valve chamber (28) exhibits two mutually opposing, essentially flat sidewalls (86) both extending in a plane perpendicular to said rotational axis (70) of the valve body (26), and

30 - **that** first, second and third valve body abutment surfaces (A, B, C), respectively, extend between said sidewalls (86) of the valve chamber (28), said valve body abutment surfaces (A, B, C) being arranged for abutting contact with the arced first flow regulatory surface (74) of the valve body (26), depending on the angular position of the valve body (26) within the valve chamber (28), wherein

35 - said first valve body abutment surface (A) is located on one side of an inlet opening (32) to the valve chamber (28), said inlet opening (32) being connected to the gas outlet opening (18) of the gas flow generator chamber (14);

- said second valve body abutment surface (B) is located between said inlet opening (32) and a bypass opening (54) arranged for directing a portion of the gas flow back into said gas flow generator (6) via a bypass conduit (52) connected to the gas inlet opening (16) of the gas flow generator chamber (14), and

40 - said third valve body abutment surface (C) is located on an opposing side of said bypass opening (54) with respect to said second valve body abutment surface (B).

2. Ventilator (1) according to claim 1, **characterized in** that the valve body (26) exhibits rounded transitional portions (80) between the arced first flow regulatory surface (74) and the second (76) and a third (78) essentially straight flow regulatory surfaces.

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3. Ventilator (1) according to claim 1, **characterized in** that the valve body (26) is formed in such a way that a sector angle (α) between the second (76) and third (78) flow regulatory surfaces is between 90°-160°.

10 4. Ventilator (1) according to claim 3 **characterized in** that said sector angle (α) is between 110°-130°.

5. Ventilator (1) according to claim 3 or 4, **characterized in** that said sector angle (α) is 120°.

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6. Ventilator (1) according to any of the preceding claims, **characterized in**
- that said gas flow generator chamber (14) and said valve chamber (28) are integrally formed in a combined gas flow generator & control valve housing (30), and that

20 - said valve chamber (28) is located in immediate conjunction to the gas outlet opening (18) of the gas flow generator chamber (14) within said combined gas flow generator & valve housing (30).

25 7. Ventilator (1) according to claim 6, **characterized in** that said gas outlet opening (18) of the gas flow generator chamber (14) also defines an inlet opening (32) to said valve chamber (28).

30 8. Ventilator (1) according to any of the preceding claims, **characterized in** that said rotational axis (70) of the valve body (26) is parallel to a rotational axis (58) of a fan rotor wheel (20) in said gas flow generator chamber (14).

35 9. Ventilator (1) according to any of claims 6 to 8, **characterized in** that an electric stepper motor is attached to the combined gas flow generator & control valve housing (30), said electric stepper motor (66) having a stepper motor shaft (68) coupled to the valve body (26) in said valve chamber (28).

10. Ventilator (1) according to claim 9 **characterized in** that the valve body (26) is provided with a through hole (72), said through hole (72) having a cross-sectional shape such that the valve body (26) is rotationally **fixed** relative to the stepper motor shaft (68), whilst being freely slidably arranged in an axial direction of said stepper motor shaft (68) for easy insertion or removal of the valve body (26) in the valve chamber (28).